

WHAT IS CLAIMED IS:-

1. A cathode ray tube device comprising:

a vacuum envelope including a substantially funnel-shaped portion having a tube axis, a panel connected to one end of said funnel-shaped portion in a direction of said tube axis, a substantially cylindrical neck connected to an opposite end of said funnel-shaped portion, said panel including a substantially rectangular screen on which horizontal and vertical axes are defined, said funnel-shaped portion including a yoke-mounting portion adjacent to said neck;

an electron gun mounted in said neck, said electron gun emitting electron beams; and

a deflection yoke mounted on an outer surface of said yoke-mounting portion, said deflection yoke including a horizontal and vertical deflection coils for deflecting said electron beams along horizontal and vertical axes, a separator provided between said horizontal and vertical deflection coils, and a hollow core with high magnetic permeability surrounding at least one of said horizontal and vertical deflection coils,

wherein said hollow core has outer and inner surfaces, and a sectional shape of at least said outer surface, in a plane perpendicular to said tube axis, varies from a substantially circular shape to a substantially barrel shape, along said tube axis from said neck side to said panel side of said hollow core, said substantially barrel shape having a maximum dimension at least in a direction of said horizontal axis or said vertical axis,

wherein said yoke-mounting portion has outer and inner surfaces, and a sectional shape of at least said outer surface, in a plane perpendicular to said tube axis, varies from a substantially circular shape to a substantially barrel shape, along said tube axis from said neck side to said panel side of said yoke-mounting portion, said substantially barrel shape having a maximum dimension at least in said direction.

2. The cathode ray tube device according to claim 1, wherein said substantially barrel shape includes two substantially straight sides extending in parallel with said horizontal axis or said vertical axis, and two arc-shaped sides in the form of circular arcs having the center of curvature aligned on said tube axis.

3. The cathode ray tube device according to claim 1, wherein a sectional shape of at least said outer surface of said hollow core has maximum dimensions Y_{hc} and Y_{vc} respectively along said horizontal axis and said vertical axis, in a plane perpendicular to said tube axis at an arbitrary position other than the proximity of said neck, and

wherein said maximum dimensions Y_{hc} and Y_{vc} satisfy the following relationships (1) and (2):

$$0.6 \times (N/M) \quad (Y_{vc}^2 - Y_{hc}^2)^{1/2} / Y_{hc} \quad 1.2 \times (N/M) \quad \dots (1)$$

when Y_{hc} is smaller than Y_{vc}

$$1.2 \times (N/M) \quad Y_{vc} / (Y_{hc}^2 - Y_{vc}^2)^{1/2} \quad 1.8 \times (N/M) \quad \dots (2)$$

when Y_{hc} is greater than Y_{vc}

where M and N respectively represent dimensions of said screen along said horizontal axis and said vertical axis.

4. A deflection yoke used in a cathode ray tube device, said cathode ray tube device comprising a vacuum envelope and an electron gun, said vacuum envelope including a funnel-shaped portion having a tube axis, a panel connected to one end of said funnel-shaped portion in the direction of said tube axis, and a substantially cylindrical neck connected to an opposite end of said funnel-shaped portion, said panel including a substantially rectangular screen on which horizontal and vertical axes are defined, said funnel-shaped portion having a yoke-mounting portion adjacent to said neck, said electron gun being mounted in said neck for emitting electron beams; said deflection yoke comprising:

horizontal and vertical deflection coils for deflecting

said electron beams along said horizontal and vertical axes;
 a separator provided between said horizontal and vertical deflection coils; and

a hollow core with high magnetic permeability surrounding at least one of said horizontal and vertical deflection coils,

wherein said hollow core has outer and inner surfaces, and a sectional shape of at least said outer surface, in a plane perpendicular to said tube axis, varies from a substantially circular shape to a substantially barrel shape, along said tube axis from said neck side to said panel side of said hollow core, said substantially barrel shape having a maximum dimension at least in a direction of said horizontal axis or said vertical axis.

5. The deflection yoke according to claim 4, wherein said substantially barrel shape includes two substantially straight sides extending in parallel with said horizontal axis or said vertical axis, and two arc-shaped sides in the form of circular arcs having the center of curvature aligned on said tube axis.

6. The deflection yoke according to claim 4, wherein a sectional shape of at least said outer surface of said hollow core has maximum dimensions Y_{hc} and Y_{vc} respectively along said horizontal axis and said vertical axis, in a plane perpendicular to said tube axis at an arbitrary position other than the proximity of said neck, and

wherein said maximum dimensions Y_{hc} and Y_{vc} satisfy the following relationships (1) and (2):

$$0.6 \times (N/M) (Y_{vc}^2 - Y_{hc}^2)^{1/2} / Y_{hc} \quad 1.2 \times (N/M) \quad \dots (1)$$

when Y_{hc} is smaller than Y_{vc}

$$1.2 \times (N/M) Y_{vc} / (Y_{hc}^2 - Y_{vc}^2)^{1/2} \quad 1.8 \times (N/M) \quad \dots (2)$$

when Y_{hc} is greater than Y_{vc}

where M and N respectively represent dimensions of said screen along said horizontal axis and said vertical axis.